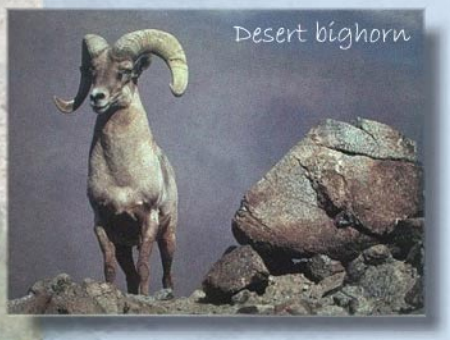
Secretary of Defense FY 2001 Environmental Awards Nomination

Natural Resources Team



Garlic Spring

National Training Center & Fort Irwin, CA

The National Training Center and Fort Irwin, CA

I. Background

Located near the center of California's Mojave Desert, the NTC & Fort Irwin is a diverse desert landscape encompassing 642,731 acres of broad, arid basins and dry lakebeds separated by rugged mountain ranges (Figure 1). Shrub dominated communities spread across the extensive basins, while the higher, cooler mountains support woodlands of junipers and Joshua trees. Fort Irwin is home to an amazing variety of wildlife, including the majestic bighorn sheep and the Federally threatened desert tortoise. Against this natural backdrop, the NTC provides tough, realistic training for visiting Army units, which are rotated through the post approximately 10 times per year. This facility has had a long history with the Army and has been used for anti-aircraft, armored, and mechanized training since 1940.

Today, this installation is the only instrumented training area in the world suitable for force-on-force and live fire training of heavy brigade-sized military forces. The training that soldiers receive at the NTC closely simulates actual combat. It provides the Army with essential training opportunities necessary to maintain and improve military readiness and promote national security. In fact, this facility played a major role in the development of tactics and training of troops in Operation Desert Storm.

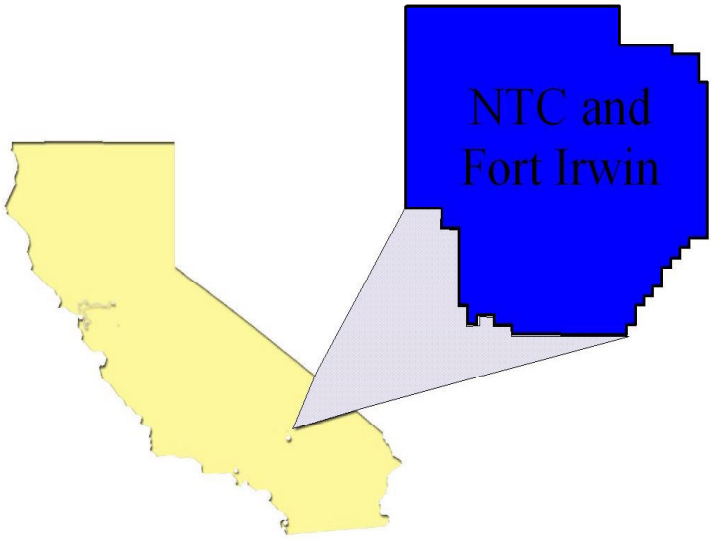


Figure 1. NTC and Fort Irwin, CA

The Army's commitment to natural resources management is reflected in the U.S. Army Environmental Strategy into the 21st Century, which focuses on responsibly managing Army lands to ensure long-term natural resource productivity so the Army can achieve its mission. This commitment is emphasized in Army Regulation 200-3 (*Natural Resources – Land, Forest, and Wildlife Management*) and NTC Regulation, 200-1 (*Environmental Protection and Enhancement at NTC*).

The Natural Resources staff is responsible for managing the diverse flora and fauna found on the NTC. The mission of the natural resources program is to provide professional management and stewardship of natural resources at the NTC and Fort Irwin while providing opportunities for multiple compatible uses of natural resources, complying with environmental laws, and supporting the military mission.

II. Position Description

A. Support Staff

The Natural Resources staff possesses a diverse background of knowledge and skills necessary to manage the program on the NTC. The staff maintains an excellent professional relationship with

the military and with federal and state regulatory agencies. They possess a positive attitude in dealing with the everyday challenges of the job, which include being located in a remote area, difficult terrain, and summer temperatures often exceeding 100 degrees Fahrenheit. Field personnel overcome these challenges by using the buddy system, maintaining radio contact with Range Control, using 4-wheel drive vehicles, and utilizing their desert training and equipment. The natural resources staff consists of the following individuals (Figure 2):

- Muhammad Bari, a Department of Defense civil service employee who serves as the Environmental Division Chief of the Directorate of Public Works
- William (Mickey) Quillman, a Department of Defense civil service employee who serves as the Natural and Cultural Resources Manager of the Environmental Division
- Mark Massar, a contractor employed by Charis Corporation who serves as the ecologist of the Environmental Division
- Ray Romero, a contractor employed by Charis Corporation who serves as the wildlife biologist of the Environmental Division
- Dr. Mark Hessing, Ph.D, a contractor employed by Charis Corporation who serves as the botanist of the Environmental Division
- Michelle Sanchez, an ORISE employee, who serves as a biologist of the Environmental Division.

Figure 2. NTC Natural Resources Staff

B. Staff Responsibilities

Management is based on sound stewardship through conservation, protection, and enhancement of natural resources with a focus on threatened and endangered species recovery (Figure 3). A variety of duties must be accomplished to successfully manage this program. The staff is responsible for the following duties:


Figure 3. Endangered Species Recovery Program

- Ensure compliance with regulations pertaining to natural resources
- Perform tasks in support of the proposed NTC expansion
- Integrate innovative approaches to data collection
- Oversee and support research
- Survey, monitor, and control exotic plant and wildlife species
- Participate in cooperative plans and programs
- Provide educational awareness and public outreach
- Produce natural resources management plans, biological reports, standard operating procedures, and maps
- Develop, conduct, and oversee surveys, monitoring, and protection of sensitive species and habitats
- Coordinate and assist the Integrated Training Area Management (ITAM) staff
- Protect and maintain natural water springs & viable and natural condition

III. Accomplishments

The staff has accomplished numerous goals over the past three years. These accomplishments have been highlighted under the headings of overall conservation management, ecosystem management, land use management, fish and wildlife, other natural resources, pest management, conservation education, community relations, mission and environmental enhancement, and natural resources compliance program.

A. Overall Conservation Management

The proactive approach of the natural resources program to conservation management includes cooperators and partners. Multiple use coordination with these agencies ensures the best management practices are being employed. The natural resources staff maintains an excellent professional relationship with several agencies (Table 2).

Several innovative approaches have enhanced the natural resources program. These approaches have led to increased efficiency and higher productivity. A Geographic Information System (GIS) has been employed and serves as a data collection repository. Global Positioning System units are used to record waypoints that are down loaded into the GIS for mapping purposes. Radio telemetry is used to monitor desert tortoise populations. Passive Integrated Transponders have been placed on desert tortoises to serve as a unique identifier for collecting data on these individuals. A Palm Pilot is used to collect and store field data and is later downloaded into a desktop computer. The NTC weather data station has been automated to collect data 24 hours a day using a radio link to a desktop computer.

Table 2. Stewardship Cooperators and Partners

Agency	Purpose
United States Fish and Wildlife Service (USFWS)	Endangered Species Act (ESA), Migratory Bird Treaty Act (MBTA), Integrated Natural Resources Management Plan (INRMP), West Mojave Coordinated Management Plan (WMCMP), Desert Tortoise Recovery Plan (DTRP), Proposed Expansion Environmental Impact Statement (EIS), Mojave Desert Ecosystem Program (MDEP)
Bureau of Land Management (BLM)	INRMP, WMCMP, EIS, MDEP
National Park Service (NPS)	MDEP
California Department of Fish and Game (CDFG)	ESA, INRMP, WMCMP, EIS, MDEP, Hunting Regulations, Bighorn Sheep Program
Natural Resources Conservation Service (NRCS)	Planning level soil surveys
Mojave Desert Ecosystem Program (MDEP)	Data Repository
United States Geological Survey-Biological Resources Division (USGS-BRD)	Research
California State University-Dominquez Hills	Research

B. Ecosystem Management

Ecosystem management on the NTC is influenced by several regional and local cooperative plans and programs. These efforts are essential in creating sound stewardship management practices. The Natural Resources Staff is actively participating in the following plans and programs.

Desert Tortoise (*Gopherus agassizii*)

- **West Mojave Coordinated Management Plan.**
  The Natural Resources Staff is intimately involved in the development of this plan, the goal of which is to serve as a regional conservation plan for the western Mojave Desert.

- **USFWS Desert Tortoise Recovery Plan.**
  The objective of this plan is to provide actions needed to protect and recover the desert tortoise. We have insured that these actions are fully implemented on Fort Irwin.

- **Integrated Training Area Management.**
  The Natural Resources staff provides much needed support to the ITAM team in meeting the objectives of this program, which aims to provide quality-training environments through monitoring of natural resources, environmental awareness, and land rehabilitation.

- **Mojave Desert Ecosystem Program.**
  The objective of this multi-agency program is to compile and distribute information in a scientific database to facilitate the management of the Mojave Desert ecosystem. We are directly involved in this program and provide data to be incorporated into this critical database.

- **Desert Managers Group.**
  The Fort Irwin Natural Resources staff is a key member of this organization, which provides a forum for government agencies that oversee the Mojave Desert ecosystem where they can address and discuss issues of common concern.

Lane Mountain Milkvetch
(*Astragalus jaegerianus*)

C. Land Use Management

The Natural Resources staff has conducted numerous biological surveys to assess potential impacts prior to any construction activities on Post. These surveys focus on sensitive natural resources and are performed in accordance with protocols and guidelines. Survey reports including findings, recommendations, and maps are produced in support of the necessary NEPA documentation. Compliance monitoring is performed to ensure all protection measures are followed during construction activities.

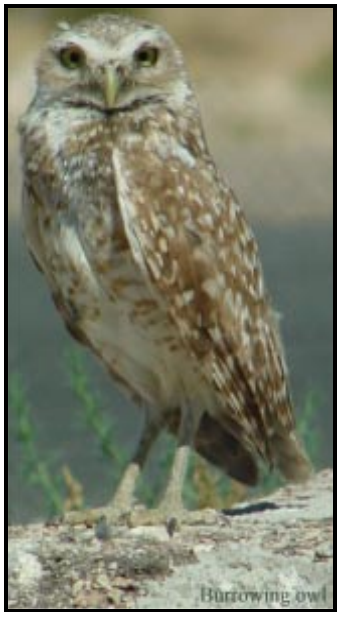
In support of the Environmental Impact Statement for the proposed NTC expansion, we conducted extensive baseline surveys in 2001 for the Lane Mountain milkvetch and the desert

tortoise, which are both Federally listed. Prior to our surveys the entire known population of the milkvetch was less than 100 plants. We've increased that number to 5,000 plants. Desert tortoise surveys within the proposed expansion area were also successful in locating numerous animals. The results of these surveys will play a key role in the expansion effort and future management of these rare species.

The southern portion of the NTC (below the 90 UTM line) has the highest densities of tortoises on post and is the focus of the desert tortoise management efforts. This area has been included in the land designated by the USFWS as critical habitat for the desert tortoise. Currently, this area is entirely off limits to military training. We maintain a 40 km long fence to insure that this area is protected, and inspect its perimeter monthly.

Desert Tortoise after eating

The 1999-2001 natural resource projects/areas and acreage surveyed and protected are provided in Tables 3 and 4, respectively.



Burrowing owl
(*Athene cunicularia*)

Table 3. Projects Surveyed and Acreage, 1999-2001

Project	Acreage
Lane Mountain Milkvetch	17,000
Line-distance Sampling	400 miles of transect
Miscellaneous Biological Surveys	550

Table 4. Protected Resources and Acreage, 1999-2001

Resource	Acreage
Playas	4,771
Natural Springs	21
Goldstone Complex	33,241
Brinkman Wash	700
Desert Tortoise Critical Habitat	22,139
Lane Mountain Milkvetch	1,500
Total	**62,372**

D. Fish and Wildlife

In 2001, the Natural Resources staff initiated a monitoring program known as line-distance sampling for the desert tortoise. This region-wide program was initiated in cooperation with the USFWS. The objective of the monitoring program is to establish baseline data for desert tortoise densities throughout its geographic range and to perform the program consistently over the next three decades. This will enable decision-makers to determine whether populations are recovering and establish management objectives accordingly.

In cooperation with the USGS-BRD, the natural resources staff has supported several long-term desert tortoise relative abundance studies on Post. The studies concentrate on assessing the demographic and health attributes of desert tortoise populations and evaluates the potential for specific sites to support relocated tortoises from nearby sites.

The natural resources staff has also supported California State University-Dominquez Hills with long-term desert tortoise neonatal studies at the Fort Irwin Study Site. The objective of this effort is to raise and release hatchling desert tortoises back into the wild to increase the survivorship of this rare species.

E. Other Natural Resources

Protecting and enhancing natural springs, which are vital for wildlife, are important components of our natural resources program. Ten springs scattered throughout the post provide the only permanent, naturally occurring water on the vast and arid NTC. All springs are strictly off-limits to military training. Specific accomplishments over the past 3 years include:

Garlic Spring

Garlic Spring

- Aggressively removing salt cedar and other non-native plants from the springs. Salt cedar is an invasive weedy species that severely degrades springs. It has been eliminated from Garlic Spring and greatly reduced at Bitter Spring. Approximately 20 acres of salt cedar have been eradicated.
- Fencing off all springs to exclude military training and non-native, destructive species like burros and cattle. We have recently replaced several kilometers of fencing around Bitter Spring. Cave Spring has been surrounded with a special type of fencing, which allows access by bighorn sheep while excluding non-native burros.
- Collecting information of the biologic and hydrologic characteristics of each spring. All springs are being exhaustively inventoried to collect baseline data on plant and wildlife species, water quality, and functional condition. This information is being supplied to the MDEP and USGS.

F. Pest Management

In 2001, as part of the natural resources program's continuing efforts to conserve and protect its desert tortoise populations, we have implemented an aggressive program to reduce ravens and coyotes, which are known predators on tortoises. Reducing raven and coyote numbers, whose numbers have recently increased due to human subsidized sources of food and water, is critical for desert tortoise recovery.

G. Conservation Education and Community Relations

Conservation education and community relations is an extremely important part of our natural resources program. We have participated in numerous outreach events, an average of six per year. These events have taken place throughout Southern California and have reached nearly one and a half million people over the past three years. We have partnered with the Bureau of Land Management, Edwards Air Force Base, and others to provide conservation education. On post, we provide conservation education to all visiting soldiers and to elementary school children. We have developed a series of pamphlets on the natural resources of Fort Irwin, and maintain a desert tortoise education facility—a large outdoor pen with four captive tortoises and landscaped with native vegetation. The following educational programs are currently in place at the NTC:

- **Observer/Controller Academy.** The Observer/Controller (OC) Academy is a 1-hour course on natural resources training for all OC personnel on post and rotational military police who escort troops along the Mannix Tank Trail. The course includes a 1/2-hour audiovisual presentation on the desert tortoise. Specific procedural information in the form of handouts and lectures explaining how to deal with desert tortoises observed in the field is provided to all personnel.

- **Opposing Forces Academy.** The Opposing Forces (OPFOR) Academy is a monthly program for leaders and officers of the opposing forces (OPFOR), who are currently stationed at the NTC. The materials provided in the OPFOR Academy include presentations, and a handout on natural and cultural resources on post, as well as a take-home quiz to reinforce learning.

- **Leader/Trainer Program.** The Leader/Trainer Program (LTP) is a 20-minute course presented one to two times each month to approximately 85 visiting officers who will be responsible for coordinating training maneuvers against OPFOR during their rotation. This course is provided approximately 90 days before the scheduled arrival of visiting forces for training exercises.

- **Additional Handouts.** In addition to the above-mentioned briefings, brochures on the desert tortoise and playas/springs are provided to further educate the military and public of these sensitive resources.

- **Elementary School Visits.** A natural resources staff member assists in educating children on Post by visiting the Fort Irwin Elementary School, providing information and class lectures on the natural history and ecology of the desert tortoise. This includes a hands-on session where tortoise shells and live tortoises are displayed.

- **Desert Tortoise Education Facility.** A Desert Tortoise Education Facility exists in the middle of the Cantonment Area at Jackrabbit Park. Currently, four captive desert tortoises are residents of the facility and can be observed by base personnel and visitors. The natural resources staff conducts tours of the facility by appointment. Tortoises in the facility are captives that have been brought to the post veterinarian by base personnel, or tortoises that have been injured on- or off-post and cannot be returned to the wild.

- **Community Relations Outreach Events.** Outreach events serve as a forum to inform the general public of the sound stewardship practices of the natural resources program. The NTC provides numerous opportunities for the public to learn about the natural resources program through participation in programs such as Safety Day, Earth Day, Armed Forces Day, Barstow Street Fair, CAIR Fair, Edwards AFB Open House, and Desert Explorer field trips to name a few. Additionally, information provided by the natural resources staff provides timely newspaper articles and spots on the base television and radio stations to provide desert tortoise information to base personnel and the public. It is estimated that nearly 300,000 thousand people have been contacted during outreach events between 1999-2001 (Table 5).

Public Outreach Events

Table 5. Educational Awareness and Public Outreach 1999-2001

Program	Number of Events	Personnel Contacted
Educational Briefings	180	3800
Tours	18	315
Public Outreach	24	300,000
Total	**222**	**304,115**

H. Mission and Environmental Enhancement

Public Outreach Event

Through compliance and education, the mission of the NTC has not been disrupted. Protecting sensitive resources and educating the military as well as the general public has led to an increased awareness of the resources that we need to protect for future generations. Today, there is a greater awareness of environmental do's and don'ts. Cooperation and coordination between the natural resources staff and military personnel has improved. As a result, military and civilian duties are accomplished in a timely manner.

I. Natural Resources Compliance Program

As required under the Endangered Species Act (ESA), the U.S. Fish and Wildlife Service (USFWS) issued a biological opinion to the Department of the Army for their current mission at the NTC. The biological opinion provides an incidental take statement and protection measures for the desert tortoise that must be undertaken to be in compliance with the ESA. The natural resources staff ensures compliance with the conditions set forth in the biological opinion through surveys, monitoring, and educational awareness.

Fort Irwin Cantonment Area

The Sikes Act requires the development and implementation of an Integrated Natural Resources Management Plan (INRMP). The objective of the INRMP is to serve as a management guide for the natural resources program. The plan will assist in the conservation of natural resources and compliance with federal and state environmental laws including the ESA. The INRMP for the NTC was completed in 2001 and is currently being reviewed by the USFWS.

As required under AR 200-3, an Endangered Species Management Plan (ESMP) was prepared in 2001 for threatened and endangered species and critical habitat present on the NTC. The objective of the plan is to ensure compliance with the ESA. The plan identifies and provides a brief description of federal and state listed plant and animal species under the ESA, discusses the threats these species encounter, defines conservation goals, and outlines a management plan that will enable achievement of the conservation goals.

IV. Conclusion

The natural resources program at the NTC has taken great strides to ensure sound stewardship is integrated with the military mission. The staff has consulted with regulators to maintain compliance with environmental laws. Surveys and compliance monitoring are performed to enforce these regulations. Several baseline surveys have been conducted in support of the proposed land expansion Environmental Impact Statement. The staff participates in numerous educational awareness and outreach events to inform the military and public of the good stewardship practices of the NTC. Innovative approaches are used to remain current in technological advances to improve the efficiency and effectiveness of the program. Research is supported to gain a better understanding of our resources and aid in the recovery of threatened and endangered species. Cooperative partnerships have been formed to ensure the best management practices available are being implemented. The NTC has clearly demonstrated that it is a leader in both military readiness and natural resource conservation.